

Mostafa Zarandi

Process Engineer, Chemical Engineer, LCA specialist



Barcelona, Spain



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PROFESSIONAL SUMMERY

I am a chemical engineer specializing in Sustainable Process Engineering, with expertise in process design, control, and optimization in basic and detailed engineering projects. My professional career includes working on industrial and scale-up projects, improving energy efficiency in systems, and developing energy management frameworks to enhance production and reduce environmental impacts with experience in simulation tools like Aspen software packages, and programming. Currently, at Eurecat, I contribute to four carbon capture and utilization projects in Catalonia region. I have experience in designing and optimization of reactors, heat exchangers, columns, turbines, etc. . I enjoy working in multidisciplinary teams to apply engineering concepts and create efficient sustainable systems.

PROFESSIONAL EXPERIENCES (+6 years)

Process System Engineer

Oct 2024 - Current

Technological center of Catalonia ([Eurecat](#)) - Spain. (Full-time)

- Scale up 4 different technologies for Carbon Capture and Utilization (CCU) (Confidential)

Researcher on Sustainable Process Development

Oct 2021 - Oct 2024

European Horizon 2020 project - Denmark and Spain. (Full-time)

- [Process and System Engineering Center](#) in Copenhagen - [SUSCAPE research group](#) in Tarragona.
- Techniques used in projects: Tecno-economic analysis, economic feasibility, equipment sizing, circular economy, environmental analysis such as LCA and prospective LCA, ISO 14040, 14044, CAPEX and OPEX calculations.
- Process simulation and modeling of an industrial scale plants for biofuel and syngas production with the capacity of 13000 bbl/d based on Oryx plant in Qatar but from semi-renewable feedstocks (woody biomass and natural gas).
- Process optimization of wastewater treatment plant with the capacity of 60 m³/h based on the feedstock of wastewater treatment plant in Reus, Spain - Increasing profit while reducing the environmental impacts.
- Pass an advanced course on Biorefineries in Jaen, Spain about conversion technologies, applications and Sustainability.
- Workshop in [European Researchers' Night project](#), Barcelona, Spain for two years. "Optimització", "Parc de Fluídica".

Process Consultant

Feb 2021 - Sep 2021

Marjan Methanol Petrochemical Complex in Iran with 5000 TPD capacity. (Part-time)

- Reactor simulation and finding the optimum operating conditions, sensitivity analysis in Aspen dynamic.
- Update mass balance and energy balance of the plant (updating PFD and P&ID).

Process Tutor

Feb 2020 - Aug 2021

One of the founder of Part Engineering Design Co. (PEDCO) ([Stopped spin-off](#)). (Part-time)

- Teaching course for +150 candidates in Computer-aided process design (Aspen plus–Hysys)

Process Engineer

Jun 2019 - Jan 2020

Shahid Hasheminejad Gas Refinery in Iran with 58 mcm/d capacity. (Part-time)

- Design of Energy Management Decision-Making systems for an industrial plant based on standards ISO and ASME.
- Modeling and optimization of the process Units (Gas Treating Unit, Water Recovery, Boilers) with Aspen Plus.
- Update mass balance and energy balance of the plant (updating PFD and P&ID).
- Developing a decision-making system for the Power plant of the refinery to predict the consumption and implement the optimal condition for the process in a Real-Time system (By online data gathering, analysis through PMS (Production Management System)) of the refinery.
- Result in 5-8% energy saving in the Power Plant.

Process Consultant

Nov 2018 - Nov 2019

Khorasan Petrochemical Company in Iran with 1000 TPD capacity ([Website](#)). (Part-time)

- Retrofitting of two heat exchangers for an Ammonia Unit with HTRI and EDR software based on TEMA.
- Proposing the optimal flow distribution for the two heat exchangers connected, pinch analysis.

Process Internship

June 2018 - Aug 2018

Jam Petrochemical Company ([The Largest petrochemical company in Iran](#)). (Full-time)

- Engineering & Energy Units (Data gathering, HAZOP and HSE datasheets).

SKILLS

• Technical Skills

Process software: Aspen Plus, Aspen Hysys, Aspen Dynamics, Aspen Custom Modeler, Aspen Energy Analyzer, Aspen Exchanger design and Rating (EDR), Aspen Adsorption, SuperPro, Pro/II, HTRI
Environmental analysis: SimaPro, Ecoinvent, GREET
Programming: MATLAB, GAMS, Fortran, Python
Others: COMSOL, AutoCAD, Microsoft office, WordPress

• Soft Skills

Team Collaboration, Independent Work, Decision-Making, Adaptability, Communication, Eager and fast learner
Versa skill training project certified: Creativity, Complex problem solving, People/team management, Time management

EDUCATIONS

Research Stay in DTU

May 2024 - Aug 2024

- [Technical University of Denmark](#).
- Wastewater Treatment Plant Integrated with Biodiesel Production, Benchmark modeling, Simulink, data analysis.

Doctoral (PhD) in URV

Oct 2021 - Oct 2024

- Sustainable Process Engineering, Chemical Engineering in Rovira i Virgili University of Spain.
- Marie Skłodowska Curie fellow, European Union's Horizon 2020 grant.
- Thesis: [Sustainable Fuel Production: A Multicriteria Analysis of Biomass and Sewage Sludge Conversion Processes](#)
- Teaching assistance for +100 students in Fundamental of process engineering, Advanced control, Applied statics
- Grade: Excellent with Honored. Supervisor: Prof. Laureano Jiménez.

Master of Science in FUM

Sep 2018 - Feb 2021

- Process control and simulation, Chemical Engineering in Ferdowsi University of Mashhad, Iran.
- Thesis: Working on Plantwide of the Gas to Liquid (GtL) process in dynamic state .
- The Best Researcher Of The Year Award, Grade: CGPA: 4/4 Ranked 1st

Bachelor of Science in FUM

Sep 2014 - Aug 2018

- Petroleum – Refinery, Chemical engineering in Ferdowsi University of Mashhad, Iran
- Project: Working on Multi-tubular catalytic reactor design with variable kinetics.

SELECTED PUBLICATIONS

Zarandi, M.; Panahi, M. Rafiee, A.; Namazi Rad, S.; Galán-Martí, A; Mateo, JM.; Jimenez, L. [Exploring the environmental and economic benefits of hybrid natural gas and biomass conversion to liquid fuels](#).

- International Journal of hydrogen energy (IF: 8.1, top 10%), 2024.
- Validated modeling based on industrial data by integrating various units for converting biomass to liquid fuels in a profitable approach, optimization of feedstock ratio and operational conditions, techno-economic analysis.

Zarandi, M.; Torres, C.; Mateo, JM.; Jimenez, L. [Multicriteria analysis of sewage sludge-based biodiesel production](#).

- Journal of Environmental Management (IF: 8, top 10%), 2023.
- Automated framework based on MATLAB and Aspen to assess feasibility and environmental impacts of biodiesel production plant from sewage sludge.

Zarandi, M.; Panahi, M.; Rafiee, A. [Simulation of a Natural Gas-to-Liquid Process with a Multitubular Fischer–Tropsch Reactor and Variable Chain Growth Factor for Product Distribution](#).

- Industrial & Engineering Chemistry Research (IF: 4.2), 2020.
- Optimal operation of catalytic multi-tubular Fischer-Tropsch reactor with variable kinetic factors on Cobalt catalyst

LANGUAGES

English: Fluent, C1 (IELTS Band Score: 7)
Spanish: Intermediate, B1
Persian: Native

REFERENCES

Carmen M. Torres Costa , carmen.torres@eurecat.org +34977297017
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Associate professor, Dr. Mehdi Panahi, mehdi.panahi@um.ac.ir